

CLAIMS:

1. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer, comprising a polishing pad (4), a drive unit (9), pressing means (6), a wafer holder (5), first dispensing means (7) and second dispensing means (8); the wafer holder for holding a wafer (W) being arranged at a holder location (L0);
5 the pressing means (6) being arranged to press the wafer holder (5) to the polishing pad (4); the first dispensing means (7) for dispensing a first fluid on the polishing pad (4) being arranged at a first dispensing means location (L1); the second dispensing means (8) for dispensing a second fluid on the polishing pad (4) being arranged at a second dispensing means location (L2);

10 the polishing pad (4) comprising a polishing surface for polishing the wafer (W), and the polishing pad (4) further being connected to the drive unit (9) for moving the polishing surface in a first direction (ω_1) relative to the holder location (L0); characterized in that

15 the first dispensing means location (L1) of the first dispensing means (7) is arranged in a downstream direction with respect to the holder location (L0) at a first downstream distance (d1), with the downstream direction being taken in relation to the first direction (ω_1); the second dispensing means location (L2) of the second dispensing means (8) is arranged in an upstream direction with respect to the holder location (L0) at a first upstream distance (d3), with the upstream direction being taken in relation to the first direction (ω_1).

20 2. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 1, characterized in that at the first dispensing means location (L1) the first dispensing means (7) dispenses an etching agent on the polishing pad (4) for dissolving abraded materials originating from the surface
25 on the wafer (W), from the polishing surface of the polishing pad (4), and at the second dispensing means location (L2) the second dispensing means (8) dispenses a mixture of abrasive particles and a passivating agent on the polishing pad (4) for passivating the surface on the wafer (W).

3. Arrangement according to any of the preceding claims, characterized in that the dispensing means (7, 8) comprise a dispensing tube.

4. Arrangement according to claim 1 or 2, characterized in that the dispensing means (7, 8) comprise a dispensing tube with a plurality of closely spaced dispensing openings.

5. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to any one of claims 1 to 4, characterized in that the surface on the wafer (W) is a surface of a metal layer.

6. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 5, characterized in that the metal layer is a copper layer.

7. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 5, characterized in that the metal layer is a tungsten layer.

8. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to any one of claims 5 to 7, characterized in that the passivating agent is an oxidizing agent for the metal layer.

9. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to any one of claims 5 to 7, characterized in that the passivating agent is a reagent that forms a layer of an insoluble metal salt on the metal layer.

10. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to any one of claims 5 to 7, characterized in that the passivating agent is a reagent that forms a thin film coating on the metal layer, the thin film being a monolayer.

11. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to any one of claims 5 to 7, characterized in that the passivating agent is a surfactant.

5 12. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 8, characterized in that the oxidizing agent is H_2O_2 .

10 13. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 9, characterized in that the passivating agent is phthalic acid.

15 14. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to any one of claims 5 to 7, characterized in that the etching agent is a dissolving agent for abraded metal / metal-oxide / metal salt materials.

20 15. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 14, characterized in that the etching agent is an acidic buffer for dissolving abraded metal / metal-oxide / metal salt materials.

25 16. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), further comprising rotational means for rotating the wafer holder (5) according to any one of the preceding claims, characterized in that the wafer holder (5), which is connected to the rotational means, is arranged so as to rotate in a second rotational direction (ω_2).

30 17. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to any one of the preceding claims, characterized in that the wafer (W)-polishing surface of the polishing pad (4) is arranged as a fixed abrasive pad, and the second dispensing means (8) dispenses the passivating agent.

18. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to any one of the preceding claims, characterized in that the second dispensing means (8) also dispenses a small quantity of the etching agent.

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19. A method to be carried out in an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer, comprising a polishing pad (4), a drive unit (9), pressing means (6), a wafer holder (5), first dispensing means (7) and second dispensing means (8); the wafer holder for holding a wafer (W), being arranged at a holder location (L0); the pressing means (6) being arranged to press the wafer holder (5) to the polishing pad (4); the first dispensing means (7) for dispensing a first fluid on the polishing pad (4), being arranged at a first dispensing means location (L1); the second dispensing means (8) for dispensing a second fluid on the polishing pad (4), being arranged at a second dispensing means location (L2);

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15 the polishing pad (4) comprising a polishing surface for polishing the wafer (W), and the polishing pad (4) further being connected to the drive unit (9) for moving the polishing surface in a first direction (ω_1) relative to the holder location (L0);

characterized by the following steps:

- to arrange the first dispensing means location (L1) of the first dispensing means (7) in a downstream direction with respect to the holder location (L0) at a first downstream distance (d1), with the downstream direction being taken in relation to the first direction (ω_1), and
- to arrange the second dispensing means location (L2) of the second dispensing means (8) in an upstream direction with respect to the holder location (L0) at a first upstream distance (d3), with the upstream direction being taken in relation to the first direction (ω_1).

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20. A method to be carried out in an arrangement of a chemical-mechanical polishing tool (3) for chemical-mechanical polishing a surface on a wafer (W), according to claim 19, characterized in that the surface on the wafer (W) is a surface of a metal layer.

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21. A method to be carried out in an arrangement of a chemical-mechanical polishing tool (3) for chemical-mechanical polishing a surface on a wafer (W), according to claim 20, characterized by the following steps:

- to dispense at the first dispensing means location (L1) by the first dispensing means, an etching agent on the polishing pad for dissolving abraded materials, originating from the metal surface on the wafer (W), from the polishing surface of the polishing pad, and
- to dispense at the second dispensing means location (L2) by the second dispensing means, a passivating agent on the polishing pad for passivating the metal surface on the wafer (W).

22. A method to be carried out in an arrangement of a chemical-mechanical polishing tool (3) for chemical-mechanical polishing a surface on a wafer (W), according to any one of claims 19 to 21, characterized in that the dispensing means (7, 8) comprise a dispensing tube.

23. A method to be carried out in an arrangement according to any one of claims 19 to 21, characterized in that the dispensing means (7, 8) comprise a dispensing tube with a plurality of closely spaced dispensing openings.

24. A method to be carried out in an arrangement of a chemical-mechanical polishing tool (3) for chemical-mechanical polishing a surface on a wafer (W), according to any one of claims 20 to 23, characterized in that the metal layer is a copper layer.

25. A method to be carried out in an arrangement of a chemical-mechanical polishing tool (3) for chemical-mechanical polishing a surface on a wafer (W), according to any one of claims 20 to 23, characterized in that the metal layer is a tungsten layer.

26. A method to be carried out in an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to any one of claims 20 to 25, characterized in that the passivating agent is an oxidizing agent for the metal layer.

27. A method to be carried out in an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to any one of claims 20 to 25, characterized in that the passivating agent is a reagent that forms a layer of an insoluble metal salt on the metal layer.

28. A method to be carried out in an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to any one of claims 20 to 25, characterized in that the passivating agent is a reagent that forms a thin film coating on the metal layer, the thin film being a monolayer.

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29. A method to be carried out in an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to any one of claims 20 to 25, characterized in that the passivating agent is a surfactant.

10 30. A method to be carried out in an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 26, characterized in that the oxidizing agent is H_2O_2 .

15 31. A method to be carried out in an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 27, characterized in that the passivating agent is phthalic acid.

20 32. A method to be carried out in arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to any one of claims 20 to 25, characterized in that the etching agent is a dissolving agent for abraded metal / metal-oxide / metal salt materials.

25 33. A method to be carried out in arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 32, characterized in that the etching agent is an acidic buffer for dissolving abraded metal / metal-oxide / metal salt materials.

30 34. A method to be carried out in arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), further comprising rotational means for rotating the wafer holder (5) according to any one of claims 19 to 33, characterized by the following step:

to arrange the rotational means so as to rotate the wafer holder (5) in a second rotational direction (ω_2).

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35. A method to be carried out by an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to any one of claims 19 to 34, characterized by the following steps:

- to arrange the polishing surface for polishing the wafer (W) of the polishing pad (4) as a
5 fixed abrasive pad;
- and to dispense the passivating agent by the second dispensing means (8).

36. A method to be carried out by an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to any
10 one of claims 19 to 35, characterized by the following step:

- to dispense a small quantity of the etching agent by the second dispensing means (8).

37. A method to be carried out in an arrangement of a chemical-mechanical
15 polishing tool for chemical-mechanical polishing a surface on a wafer (W) according to any one of claims 19 to 36, characterized in that the chemical-mechanical polishing treatment is used in the manufacture of a semiconductor device, the wafer (W) comprising a substrate of a semiconductor material.

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